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ABSTRACT

A review of more than 3,000 books, monographs, journal articles, papers and other reports was conducted to discover what kinds of design, measurement, and analytical lessons have been learned as a result of the enormous volume of college-impact-on-student studies that have been published in the last 20 years and to determine how these lessons might help researchers in this area to be more effective. Eight "lessons" are discussed which are meant to offer a constructive critique of current research designs, methods, and substantive foci; in addition, a constructive critique is offerred suggesting ways in which that research might be made more rigorous, informative, and supportive of educational program and policy decision making. It is suggested that greater efforts be made in the following eight tasks, which are examined in detail: (1) differentiating between simple change occurring in students during the college years and the "net effects" of college, (2) better estimating the magnitudes of college effects, (3) better examining when student change occurs, (4) better exploration into measuring indirect as well as direct collegiate effects, (5) more focus on college's effect coming about because of specific student characteristics (race, age, etc.), (6) making greater use of qualitative research methods, (7) expanding the theoretical perspectives that guide research and assessment study designs, and (8) greater focus on the effects of the academic program and the teaching-learning process on students overall. Contains 10 references. (GLR)

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TWENTY YEARS OF RESEARCH ON COLLEGE STUDENTS: LESSONS FOR FUTURE RESEARCH

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This paper was presented at the Thirtieth Annual Forum of the Association for Institutional Research held at The Galt House, Louisville, Kentucky, May 13-16, 1990. This paper was reviewed by the AIR Forum Publications Committee and was judged to be of high quality and of interest to others concerned with the research of higher education. It has therefore been selected to be included in the ERIC Collection of Forum Papers.

Jean Endo
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TWENTY YEARS OF RESEARCH ON COLLEGE STUDENTS:
LESSONS FOR FUTURE RESEARCH

Twenty years have passed since Feldman and Newcomb (1969) published their landmark book, The Impact of College on Students, in which they reviewed forty years of theoretical propositions and empirical research on college students. Much has happened since then as the effects of college on students as an field of inquiry has grown qualitatively and quantitatively in both theory and method. Whole areas of inquiry, such as the effects of college on learning, cognitive development, moral reasoning and various indices of status attainment, have developed into maturity. Theories of student development and change have emerged in sometimes daunting number and variety. Multivariate statistical procedures, adequate to the task of testing and extending these emergent and complex theories, have became increasingly accessible to scholars (a development with mixed blessings). History-altering advances in both mainframe and microcomputing hardware and software have been the handmaidens of these advances, facilitating both the complex statistical analyses testing equally complex theories and permitting the analysis of large, nationally-representative databases.

In the last decade, the increasing costs of college attendance and operation, as well as mounting criticism of the quality of undergraduate education in the United States, have also spurred research on college outcomes. Earlier questions of cost, now answered, have been followed by questions of worth and value, of education's "return on investment" in both economic and noneconomic terms. "Assessment" of undergraduate student learning gained in popularity as a vehicle for a public

accounting of an institution's stewardship of its resources and as a mechanism for improving the quality of the education offered.

The phenomenally productive conjunction of all these developments -- in theory, methodological sophistication, computing, cost, criticism, and oversight -- created a burgeoning literature on the effects of college on students that has more than doubled in size that produced in the preceding four decades reviewed by Feldman and Newcomb (1969). What have we learned about studying college impacts from this enormous volume of research? What kinds of design, measurement, and analytical lessons can be drawn from it that might help researchers do better research in the future? This paper discusses eight such "lessons." It offers a hopefully constructive critique of current research designs, methods, and substantive foci, suggesting ways in which that research might be made more rigorous, informative, and supportive of educational program and policy decision-making.

METHODS

Virtually all research relevant to student change during college and produced since 1967 was reviewed. To identify relevant studies, searches were made of various abstracting documents or databases, such as Sociological Abstracts, Psychological Abstracts, Sociology of Education Abstracts, Dissertation Abstracts, College Student Personnel Abstracts, Higher Education Abstracts, and the ERIC system. Recent conference proceedings from such scholarly and professional associations as the American Educational Research Association, Association for the Study of Higher Education, and the Association for Institutional Research were also reviewed. Finally, an extensive network of colleagues was used to

obtain unpublished papers or technical reports which dealt with college impact.

Despite the potential advantages of meta-analysis for synthesizing a large body of literature (see Cooper, 1982; Glass, 1977; Jackson, 1980; Pillemer & Light, 1980; Light & Pillemer, 1982), a number of factors led us to decide against using meta-analysis. First, meta-analytic techniques have come under close and often critical scrutiny in terms of their producing a truly objective and meaningful synthesis of evidence. These and related criticisms of meta-analysis are cogently reviewed by Slavin (1984), who concludes that meta-analysis can be a useful supplement to traditional narrative, explanatory reviews, but should not be seen as a replacement for them.

The second, and perhaps more important, reason for our deciding against meta-analysis as the primary method of synthesizing the evidence was simply the remarkable diversity of ways in which research on the impact of college on students is reported. The simple fact is that in many areas of inquiry the broad range of statistical evidence employed to report results makes the use of quantitative synthesis impractical if not impossible. Related to this issue was our concern that the requirements of quantifying study results in a comparable metric would exclude studies based on naturalistic inquiry or other relevant investigations where the results were simply not amenable to the computation of effect sizes.

Thus, we turned to a narrative explanatory synthesis as our primary approach to the analysis of evidence. In this approach we were guided by the criterion of "weight of evidence." That is, given a logical analysis of the studies conducted, what does the weight of evidence suggest about

the influence of college or the influence of different aspects of the collegiate experience?

FINDINGS AND CONCLUSIONS

Eight lessons can be drawn from this review of more than 3,000 books, monographs, journal articles, papers, and other research reports:

1. Simple change must be differentiated from the "net effects" of college.

The vast majority of studies we reviewed focus on change during the college years. Some of these studies were cross-sectional in design, based on a random sample of enrolled students (sometimes all class years, sometimes only seniors and freshmen). While the class year variable in cross-sectional studies can be argued to be a proxy for varying amounts of exposure to college, this design has numerous flaws which threaten its internal validity (see, for example, Pascarella, 1987; Pascarella & Terenzini, in press, Appendix A). Other studies were longitudinal panel studies, the same individuals in a cohort of entering freshmen being followed-up one or more years later. Longitudinal designs using only college students, while generally much stronger designs for measuring change, shed no light on the extent to which any observed changes are due to the college experience since the degree of exposure to college is the same for all study participants. In over twenty years of research, the number of studies we found that employed a control group of college-age individuals who did not attend college can be counted on the fingers of one hand.

In short, virtually all of the studies done to-date shed useful light on the extent to which students change during the college years, but change during college is not the same as change due to college. The

drop-off in the volume of relevant research when one moves from studies of change during college to studies of change due to college attendance is striking and should be a source of some concern.

Change due to the college experience is sometimes referred to as the "net effects" of college. This phrase refers to the changes in students over time that can be attributed to the college experience and not to other sources of influence, such as normal maturation or conditions and events external to the campus. For example, if one is interested in assessing the extent to which increases in cognitive development can be attributed to college attendance (versus non-attendance), one must take into account those other variables <u>besides college attendance</u> which are likely to influence changes in critical thinking (e.g., intelligence, academic aptitude and high school achievement, cognitive development, socioeconomic status, and so on). If one were to compute the association between college attendance and a measure of cognitive development while statistically controlling for intelligence, the results would be an estimate of the effect of college on cognitive development <u>net</u> of (or independent of) the confounding influence of initial intelligence.

It is essential to the design of effective programs, professional integrity, and public credibility that claims about the benefits of college attendance be supportable with evidence that separates college effects from non-college influences (e.g., pre-college differences and normal maturation). Current claims about the benefits of college attendance frequently extend well beyond the empirical evidence to support them. Controlling the numerous alternative, non-college sources of influence can be a daunting undertaking. It will require greater use of non-college control groups and more extensive use of relevant theories

in the design of studies. Such careful theoretical preparation and grounding is not one of the distinctive characteristics of most of the research done over the past two decades, but higher education as a field of inquiry has clearly started down that road, and we wish to encourage its continuation. Theory-based research will not only be more sharply focused and parsimonious, but it is also likely to reflect more fully the complexity of college impacts.

2. Effect sizes should be estimated.

Most studies identify statistically significant changes in students over time, but few examine the magnitudes of those changes. While it may be meaningful to report simply whether an independent variable is related to a dependent, outcome variable at some level of statistical significance, it is much more meaningful, as well as theoretically and practically informative, also to estimate the strength of the relation. Many of the studies we reviewed failed to report even the most rudimentary information (e.g., means and standard deviations) that might be used to estimate effect sizes.[1]

Reporting estimated effect size can reasonably be expected to lead to theories that are more parsimonious and better reflect the reality of college impact. It is necessary, but not sufficient, to know that group differences or changes are not due to chance. It is equally important to know whether the difference or change is educationally or administratively significant. Administrators can be expected to make programmatic, policy, and budgetary decisions at least in part on outcomes assessment information. They have a reasonable right to know -- and institutional researchers a corresponding obligation to provide information on -- whether the impact of college or some aspect of the

college experience is large enough to warrant attention, resources, and action.

3. Little is known abut when changes occur.

Much of the assessment literature examines change during the freshman year, or from freshman to senior years but not during the intervening years. Only a handful of the studies we reviewed monitored change on an annual, sequential basis. Thus, we know little about whether change is mostly linear and monotonic, or whether it is primarily episodic and discontinuous over the college years. Moreover, it seems reasonable to suggest (and there is some basis for believing) that the pacing of change varies across outcome areas. Much more attention needs to be given to the analysis of the timing of change during college. For policy and program planning purposes, it is, of course, important to know whether change occurs, but it is at least as important to know when an intervention will make a difference and when it won't so that institutional efforts and resources can be brought to bear when they are most likely to be effective.

4. Important indirect college effects may be going unnoticed.

Much of the research on colleges' net effects indicates they tend to be small in size. That college effects are, in fact, small is only one of the possible explanations for this fairly consistent finding. Others include weak or unreliable measures; use of distal predictor measures (e.g., living on- vs. off-campus) instead of more proximal ones (e.g., measures of the frequency and nature of students' interactions with peers and faculty members within the living environment); measures constructed to place a premium on test-retest reliability (and therefore perhaps biased against showing change) (Winter, 1979; Winter, McClelland, &

Stewart, 1981), and the essentially conservative nature of the analytical procedures typically employed (e.g., hierarchical regression or path analytic models, which attribute variance jointly explained by pre-college and college experience variables entirely to the pre-college variable set).

Another possible explanation -- often overlooked -- is that a college effect may be indirect, as well as direct. A direct effect can be thought of as the unmediated influence of one variable on another (i.e., the impact is direct and does not pass through an intervening variable). Although the descriptor "direct" is seldom used in the research literature, direct effects are by far the most frequently estimated effects in educational or social science research. Using our previous example, if going to college has a significant association with cognitive development when intelligence is controlled, then it can be said to have a direct effect on cognitive development net of intelligence. Conversely, if the association between college attendance is nonsignificant when intelligence is taken into account then college can be said to have no direct effect on cognitive development net of intelligence.

Although it is seldom estimated in the existing research, a variable may also have an "indirect" or mediated effect on an outcome. This occurs when that variable's effect is transmitted through an intervening variable(s). For example, it is possible that college attendance may have an important indirect effect on adult cognitive development by influencing a person's reading habits. Thus, the path of indirect influence would be college attendance directly affecting reading habits, and reading habits, in turn, directly affecting cognitive development.

In this and similar ways college could have a significant impact on a range of outcomes without having a direct effect on them. In our synthesis of the research evidence, we have been impressed by how many of the effects of college are, or could be, indirect. For example, while major levers of institutional influence (e.g., residence halls) may not have substantial effects on student change in various areas, they do have important indirect effects, influencing other variables which, in turn, have a substantial impact on students.

Thus, as much of the evidence we reviewed suggests, it is entirely possible that we may be underestimating or even misrepresenting the impact of many college influences by failing to consider their indirect effects. Because some source of influence in the causal chain is none step removed from having a direct effect on a given outcome makes it no less theoretically or practically important. Indeed, its consideration may add substantially to our knowledge of educational effects. Of course, any consideration of indirect effects means that one must typically conceptualize research questions in terms of theoretical models, but such a process is likely to reflect more fully and accurately the complexity of college impacts.

5. Research on conditional effects will be increasingly important.

A "general" effect suggests that a particular collegiate experience is the same for all students who experience it. A "conditional effect" suggests that the magnitude of the effect is conditional upon, or varies according to, the specific characteristics of the individuals being considered (e.g., minority vs. nonminority, male vs. female, traditional-aged vs. older students). Conditional effects are sometimes referred to as "interaction effects" in that individual student

differences are said to "interact" with the particular experience or condition thought to influence a particular outcome.

Despite many undoubtedly sincere statements about the importance of respecting individual student differences, relatively little attention has been given in the research and assessment literature to examining how college effects vary according to students' characteristics. Are the effects of college the same regardless of the student's sex? Race or ethnicity? Academic ability? Socioeconomic status? Answers to such questions are becoming increasingly important, particularly those related to race/ethnicity, sex, and age. If most demographic profiles of the college population for the next decade are anywhere near accurate, minority and older students will constitute a much larger proportion than they do at present. Current programs, designed primarily with traditional-aged white student populations in mind, may or may not have the same effects on different kinds of students. If more is known about how different kinds of students respond to similar experiences, programs and policies can be tailored and their effectiveness increased .

6. Greater use should be made of qualitative research methods.

The current literature on college effects is almost exclusively quantitative. While the logical positivist, quantitative paradigm has served us well, judicious and creative qualitative approaches are capable of providing greater sensitivity to many of the subtle and fine-grained complexities of college impact than the more traditional quantitative approaches. Naturalistic and ethnographic inquiries may be particularly sensitive to the kinds of indirect and conditional effects just discussed We expect that in the next decade, important contributions to our understanding of college impact will be produced by qualitative research

approaches. Forewarned is forearmed, however: qualitative methods are often thought to be less rigorous and less demanding than quantitative approaches. They are not.

7. A single paradigm dominates current research on college effects.

Most of the prominent contributors to theory development and research on the impact of college on students have been or are psychologists. As a consequence, past and current research on college impacts is distinguished by its almost exclusive reliance on psychological models. Similarly, for the past quarter-century, graduate programs that have trained (and continue to train) many of higher education's researchers and administrators have had their conceptual origins largely in one theoretical genre. Theories from other fields have only recently begun to receive notice. Indeed, many researchers in higher education appear to be unaware of a substantial theoretical and empirical literature relating to collegiate effects based in other disciplines, especially sociology and anthropology. The need for new perspectives on college impacts is particularly acute in studies of students' non-cognitive, psychosocial changes. An alarming number of studies in these areas reflect little familiarity with the knowledge base outside the author's primary discipline. Whether many of the observed changes reported in the literature are due to developmental, psychosocial restructuring within students, or to learning through the socialization process of competencies, attitudes, values, and behaviors valued by important others, remains very much an open and vital question. Single-paradigm research or assessment programs are likely to restrict the range of analytical vision, the depth of understanding, and, consequently, the effectiveness of academic and non-academic programs.

8. Certain areas of study are particularly in need of attention.

While the sheer volume of studies of the effects of college on students done over the past twenty years is truly impressive, several important holes in the research fabric are identifiable and become more glaringly so as time passes. One in particular that stands out is the impact of the academic program and the teaching-learning process. How do different teaching and instructional approaches influence not only how much content is learned, but also what higher order thinking skills are developed? How and in what ways does the academic program influence values and personal development? Are there particular teaching or instructional approaches which are differentially effective for different kinds of students? Answers to these and similar questions will constitute major contributions to our understanding of the impact of college.

A second important, but virtually unexplored, area of inquiry is the nature and dynamics of the collegiate experience for significant groups of nontraditional students. The absence of rigorous research on the effects of college on minority students and older students is particularly embarrassing to the higher education research community. As noted earlier, demographic forecasts for the next decade consistently indicate that the proportion of minority students in America's colleges and universities will increase, dramatically among some groups. Higher educational administrators cannot long delay responding to this and related trends. If researchers are to help prepare our higher educational system for these changes, much, much more must be learned about how the collegiate experience, academic and non-academic, differs

for minority versus majority groups, and for older versus traditional-aged students.

Other areas of inquiry that have been largely ignored in any detail include the dynamics of student and faculty interaction, the comparative influences of faculty and peer groups, and institutional subenvironments and subcultures that shape college's effects through their mediating influences on students' interactions with peers and faculty members. It will be particularly important to examine students' interpersonal experiences in both formal and informal learning settings. Continued research focusing on such distal environmental measures as living on- vs. off-campus, academic major, or similarly distal institutional characteristics, such as size, type of control, or even selectivity, is unlikely to advance our knowledge about college effects. More proximal and precise specification of the worlds in which students live are needed.

SUMMARY

This paper has attempted to help improve the quality of future student outcomes research on individual campuses by suggesting some of the future directions these studies might pursue. The maturation of this area of study over the years is apparent in studies of college impact published or reported in the last twenty years. Much remains to be done, however. In particular, we have argued, future research and assessment studies and programs should devote greater efforts to eight tasks: 1) to differentiating changes that occur <u>during</u> college from those that are <u>due to</u> college (so that current claims about the benefits of college attendance might be supported); 2) to estimating the magnitudes of college effects (so that the educational and administrative, as well as

statistical, significance of results might be evaluated); 3) to examining not simply whether change occurs but also when it occurs (so that more tailored and effective programs and policies might be designed); 4) to exploring and measuring indirect, as well as direct, collegiate effects (so that the magnitude of college's effects will not be underestimated); 5) to the study of college effects that may be conditional on student characteristics such as race/ethnicity, age, and sex (so that important variations in college's effects might be better understood and more effective programs and policies be designed); 6) to making greater use of qualitative research methods (so that important information inaccessible with quantitative methods will not be lost); 7) to expanding the theoretical perspectives that guide research and assessment study designs (so that theoretically myopic studies might be avoided), and 8) to focusing greater attention on the effects of the academic program and the teaching-learning process, the experiences of minority and older students, and the dynamics of students' interpersonal contacts with peers and faculty members (so that the educational experience might be maximized for all students).

FOOTNOTE

1. Effect sizes can be estimated as the average change in freshman-to-senior year scores (whether for cross-sectional samples of, say freshmen and seniors, or for longitudinal panels) calculated in terms of standard deviation units. More specifically, an effect size can be estimated by subtracting a freshman year mean score from the senior year mean and then dividing that difference by the freshman year standard deviation. When expressed in standard deviation units, an effect size can be converted (using the area under the normal curve) to a "percentile point change" estimate. For example, given an estimated effect size equal to 1 standard deviation, the area under the normal curve extends from the 50th to the 84th percentile, indicating a percentile point change of 34 percentile points from the freshman to senior year.

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